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AGENDA ITEM 3

TO: MEMBERS OF THE INVESTMENT COMMITTEE

I. SUBJECT: Public Employees' Retirement Fund (PERF) Strategic Asset Allocation / Recommendation

II. PROGRAM: Asset Allocation / Risk Management

II. RECOMMENDATION:

- A. Adopt the new Alternative Asset Classification (AAC) as shown in Table 1 on page 2.
- B. Adopt an asset allocation mix from among the alternatives presented in Table 5 on page 7.
- C. Adopt Asset Class Ranges (ACR) as shown in Table 6 on page 8.

IV. ANALYSIS:

Overview

Staff presented two objectives for consideration by the Investment Committee (the Committee) during the Asset Liability Management (ALM) Workshop conducted on November 8 and 9, 2010. The two objectives were as follows:

- 1. Selection of AAC for the Policy Portfolio based on macro risk factors
- 2. Selection of Policy Portfolio from among alternatives based on the Committee's risk tolerance as indicated by Decision Factor (DF) scores.

Final staff recommendations based on Committee responses and directives to staff from November's presentation are provided below. Pension Consulting Associates and Wilshire Consulting Opinion Letters are included as Attachments 2 and 3, respectively. CalPERS Chief actuary will be available at the meeting to

provide comments to the Committee and will be making his final recommendations on the actuarial discount rate in February 2011

Alternative Asset Classification

Based on Committee member input, the Chair directed that the AAC is preferred to the current Asset Classes. Accordingly, staff is recommending that the Committee approve the AAC shown in the table below.

TABLE 1 – ALTERNATIVE ASSET CLASSIFICATION CHARACTERISTICS

AAC	Consists of	Purpose
Growth	Public Equity Private Equity	Positive exposure to economic growth - equity risk premium
Income	Fixed Income	Provide income return
Real	Real Estate Infrastructure Forestland	Provide long horizon income return that is less sensitive to inflation risk
Inflation	Commodities Inflation-Linked Bonds	Public market investments with positive inflation exposure
Liquidity	Cash Nominal Government Bonds	Hedge equity and deflation risks provide liquidity

While diversification among the various assets provides optimal trade-off between risk and return in normal market conditions, it does not provide explicit protection from extreme market risks as in the recent crisis or in the event of economic scenarios such as high inflation. The AAC introduces the concept of two hedging Portfolios to protect against:

1. Extreme market risks (Liquidity)
2. Rising inflation.

Staff believes this structure provides a combination of return seeking and hedging Portfolios that will allow for better risk management and capital allocation.

Policy Portfolio

In regard to the second objective, staff presented an array of eight viable asset mixes from the segment of the efficient frontier generated from the asset/liability inputs (slide 1 of Attachment 1). The expected returns of these Portfolios range from 6.00% to 7.49% and the risks from 7.59% to 12.51%, respectively. The current Policy Portfolio corresponds to Portfolio A7 with only one Portfolio (A8) with a higher risk/return. The efficient frontier has shifted downwards due to the lower expected returns of most Asset Classes compared to the last review. In particular, the Fixed Income return has come down considerably as yields have compressed to historical lows and expected returns are related to current yields. Additionally, constraining Fixed Income allocation to a 15% minimum limit is required as a prudent measure to diversify equity risks. Expected Portfolio return higher than 7.5% is possible only by relaxing the Fixed Income minimum constraint.

Decision Factor Scores

A DF scoring framework was used to assist the Committee in determining the level of risk tolerance. The four DFs are as follows:

TABLE 2 – DECISION FACTOR FRAMEWORK

Funding Level Related		
DF1	Improve Funding	Funded ratio is to improve to 90% at the end of 10 years
DF2	Avoid Low Funding	Funded ratio is to be above 38% at the end of 10 years
Cost Related		
DF3	Minimize Employer Contributions	The average employer contribution is to be below 19% at the end of 10 years
DF4	Stabilize Employer Contributions	The average employer contribution is to not increase above 40% at the end of 10 years

DF1 and DF3 are return seeking. DF2 and DF4 are risk mitigating in that they seek downside protection. Based on current actuarial smoothing method, which has been used to project future contribution rates, DF3 and DF4 have a minimal impact as shown in the decision framework. In order to highlight the downside risk (DF3 and DF4), staff designed a low growth case as an alternative to the base case. The low growth case assumes a 30% probability of recession in a given year compared to the average of about 20%. Under the low growth case, the expected returns are lower than the base case.

Random simulations (1,000) of returns were performed for each Portfolio and contribution rates and funded ratios computed for each simulated path. Based on the contribution rates and funded ratios generated by the simulations, each Portfolio was assigned a set of DFs. Applying the consensus weight for each DF to the DF scores resulted in preference scores and rankings for each Portfolio.

The final average DF scores as assigned by the Committee are listed below. The 2007 ALM Workshop scores are shown for comparison.

TABLE 3 – DECISION FACTOR SCORING

<u>No.</u>	<u>DF Characteristics</u>	<u>2010</u>	<u>2007</u>
1	Improve Funding Level	40.0%	35.7%
2	Avoid Deterioration in Funding Level	10.0%	14.6%
3	Minimize Employer Contribution Rates	37.0%	25.5%
4	Stabilize Employer Contribution Rates	<u>13.0%</u>	<u>24.2%</u>
TOTALS		100.0%	100.0%

The scores for DF1 and DF3 (return seeking) add up to 77% and the scores for DF2 and DF4 (risk mitigation) total 23%. This indicates a preference for higher risk/return Portfolios within the range provided.

Portfolio Rankings

Based on the DF scores, the rankings of the Portfolios were as follows:

TABLE 4 – PORTFOLIO RANKINGS

<u>Rank</u>	<u>Candidate Asset Mix</u>	<u>Preference Score</u>	<u>Expected Return</u>	<u>Expected Risk</u>
1	8	6.86	7.49%	12.51%
2	6	6.36	7.25%	11.41%
3	7	6.26	7.38%	11.92%
4	5	4.85	7.00%	10.50%
5	3	4.50	6.50%	8.90%
6	4	4.50	6.75%	9.66%
7	2	3.49	6.25%	8.20%
8	1	3.18	6.00%	7.59%

Committee Directions

The Committee directed staff to present alternative Portfolios for A8 by lowering the Liquidity (Treasury) allocation from 4% to 2% and 1% and increasing the Infrastructure and Forestland (Real) allocation from 3% to 5%. These alternative Portfolios are shown on slide 3 of Attachment 1 as A8.1, A8.2 and A8.3.

Additionally, the Committee also directed staff to bring back Portfolio A7, which is the equivalent of the current Portfolio with alternatives based on adjusting the Liquidity and Real allocations as mentioned above. These Portfolios are shown as A7.1 to A7.4 on slide 6 of Attachment 1. Staff also generated an intermediate Portfolio A7.5 by reducing the Liquidity allocation of Portfolio A7 by 2% and increasing the Public Equity allocation by 2%. This Portfolio has risk/return characteristics between A7 and A8 with an expected return of approximately 7.5%.

Risk Attributes

Portfolio A8 has a 50% probability of the funded ratio reaching 71% at the end of 10 years from the current level of 65%. On the upside, the probability of achieving a funded ratio of 96% is 20% at the end of 10 years. On the downside, there is a 20% probability of the funded ratio being less than 52% (slide 9) which is more pronounced in the weak growth case with 20% probability that the funded ratio is less than 38% (slide 10). Under the weak growth case, the expected funded ratio (50% probability) at the end of 10 years is 53% (slide 10).

The expected employer contribution rate (50% probability) at the end of 10 years is 24% and there is a 20% probability that the contribution rate is more than 33% (slide 11). Under the weak growth case, the expected employer contribution rate (50% probability) is 32% and there is a 20% probability that the contribution rate is more than 42% (slide 12). Portfolio A8 has 67% growth (equity) exposure and only 1% exposure to inflation hedging assets. The 0% allocation to Commodities would require selling the current \$2.5 billion Commodity position. Portfolio A8.1 is a more practical alternative to A8 with a 1% allocation to Commodities and a Liquidity (Treasury) allocation reduction from 4% to 2%.

Portfolio A7 has a 50% probability of the funded ratio reaching 68% at the end of 10 years from the current level of 65% (slide 9). On the upside, the probability of achieving a funded ratio of 92% is 20% at the end of 10 years. On the downside, there is a 20% probability of the funded ratio being less than 50% (slide 9). The downside risk is more pronounced in the weak growth case with a 20% probability that the funded ratio is less than 38% (slide 10). Under the weak growth case, the expected funded ratio (50% probability) at the end of 10 years is 53% (slide 10).

For Portfolio A7, the expected employer contribution rate (50% probability) at the end of 10 years is 24% and there is a 20% probability that the contribution rate is more than 33% (slide 11). Under the weak growth case, the expected employer contribution rate (50% probability) is 32% and there is a 20% probability that the contribution rate is more than 42% (slide 12). Portfolio A7 has 63% growth (equity) exposure and a 4% allocation to each of the Inflation and Liquidity buckets.

Portfolios A8 and A7 are not very different in terms of the expected funded ratios and contribution rates at the end of 10 years. Portfolio A8 has an expected funded ratio of 71% while Portfolio A7 is 69%. The expected contribution rate for both A8 and A7 at the end of 10 years is 24%. The upside funded ratio at 20% probability is higher for A8 at 96% than for A7 at 92%. The downside funded ratio at 20% probability is also slightly higher for A8 at 52% compared to 50% for A7. Higher contribution rates are assumed to 'kick in' as funded ratio falls so that higher funded ratio for A8 is associated with higher contribution rates in the interim periods.

Both Portfolios have an expected funded ratio of 53%, lower than the current 65%, in the low growth case where expected returns are lower. In summary, achieving funding progress in the current diminished expected return environment is difficult as liabilities steadily increase, and the downside risk to funded ratio is also significant. Hence, staff recommends selecting the lower risk Portfolio (A7) over the alternatives presented.

Viable Portfolios

Staff believes that an allocation of 1% to the Liquidity bucket is inadequate considering the liquidity needs to fund the deficit between contributions and benefit payments and the substantial unfunded commitments in the private asset classes. Additionally, under the AAC, the Liquidity bucket serves as a hedge for market risks, particularly in times of stress and a very small allocation does not satisfy the objective. Staff also believes that a 5% target allocation to Infrastructure and Forestland cannot be implemented within a three year period considering the current investment is around 1.5% and the proposed 3% target will be a 'stretch goal'. Hence, considering the alternative Portfolios, staff believes the following are viable Portfolios, although A8.1 represents a higher level of risk than the current Portfolio.

It is important to note that the return assumptions (slide 17 of Attachment 1) for the various assets assume a return premium for riskier asset classes. As pointed out at the November 2010 ALM Workshop, this relationship was inverted over the past 10 years with less risky assets (bonds) having the highest return. However, the asset allocation process assumes the positive risk premium relationship to hold true over the long term. Staff also pointed out that the current economic environment is very uncertain and a low growth and/or high inflation scenario will result in lower return expectations.

TABLE 5 – VIABLE PORTFOLIOS

	A7	A7.1	A7.5	A8.1	Current
COMPOUND RETURN	7.38%	7.39%	7.46%	7.53%	7.38%
VOLATILITY	11.92%	11.92%	12.20%	12.51%	11.97%
AVERAGE RETURN	8.04%	8.05%	8.15%	8.25%	8.05%
INCOME - Fixed Income	15.9%	18.0%	16.0%	15.0%	20.00%
GROWTH - Public Equity	49.1%	49.0%	51.0%	53.1%	49.00%
GROWTH - Private Equity	14.0%	14.0%	14.0%	14.0%	14.00%
REAL - Real Estate	10.0%	10.0%	10.0%	10.0%	10.00%
REAL - Infrastructure & Forestland	3.0%	3.0%	3.0%	3.0%	2.50%
INFLATION - Inflation Linked Bonds	3.0%	3.0%	3.0%	1.9%	1.00%
INFLATION - Commodities	1.0%	1.0%	1.0%	1.0%	1.50%
LIQUIDITY - Treasuries	4.0%	2.0%	2.0%	2.0%	2.00%
INCOME	15.9%	18.0%	16.0%	15.0%	20.0%
GROWTH	63.1%	63.0%	65.0%	67.1%	63.0%
REAL	13.0%	13.0%	13.0%	13.0%	10.0%
INFLATION-LINKED	4.0%	4.0%	4.0%	2.9%	5.0%
LIQUIDITY	4.0%	2.0%	2.0%	2.0%	2.0%

TABLE 6 – PROPOSED RANGES FOR AACs

<u>AAC</u>	<u>Proposed Target</u>	<u>New Range</u>	<u>Current Range</u>
Growth (Public & Private Equity)	63%	±7%	±7%
Income (Fixed Income)	16%	±5%	±5%
Real	13%	±5%	±5%
Inflation	4%	±3%	2 to 5%
Liquidity	4%	±3%	0 to 5%

It should be noted that with the combination of Public Equity and Private Equity in the Growth category, there will be a single range with any overweight to Private Equity relative to the 14% target coming from Public Equity. The range for Liquidity assumes a 4% target as in Portfolio A7. Should a different target allocation be selected for Liquidity, the range should be reconsidered. It should also be noted that the Inflation category now consists of Inflation-Linked Bonds and Commodities with Infrastructure and Forestland being shifted to the Real Asset category. Staff is recommending the ranges be similar to those in the current policy with somewhat wider ranges for Inflation and Liquidity to allow greater flexibility depending on economic scenarios. Staff will recommend specific active risk (tracking error) guidelines for Portfolio implementation in a risk budget framework in the amendments to the Asset Allocation Policy in February 2011.

V. STRATEGIC PLAN:

This item addresses Strategic Plan Goals VIII, manage the risk and volatility of assets and liabilities to ensure sufficient funds are available, first, to pay benefits and second, to minimize and stabilize contributions; and IX, achieve long-term, sustainable, risk adjusted returns.

VI. RESULTS/COSTS:

Adoption of a revised Policy Portfolio would result in some transaction costs, though these costs are expected to be small relative to the benefits.

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